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MONTHLY REPORT - AUGUST 1979

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LA JOLLA, CALIFORNIA

HONOLULU LABORATORY
LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

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STATUS OF PUBLICATIONS

Published

Mendelssohn, Roy. 1979. Determining the best trade-off between expected economic return and the risk of undesirable events when managing a randomly varying population. J. Fish. Res. Board Can. 36:939-947.

Conditions are given that imply there exist policies that "minimize risk" of undesirable events for stochastic harvesting models. It is shown that for many problems, either such a policy will not exist, or else it is an "extreme" policy that is equally undesirable. Techniques are given to systematically trade-off decreases in the long-run expected return with decreases in the long-run risk. Several numerical examples are given for models of salmon runs, when both population-based risks and harvest-based risks are considered.

Approved by the Center Director

Alvariño, Angeles. The relation between the distribution of zooplankton predators and anchovy larvae. For publication in the Fishery Bulletin, U.S.

Eldridge, M.B., J.A. Whipple, and D. Eng. Endogenous energy sources as factors affecting mortality and development in striped bass (Morone saxatilis) eggs and larvae. For publication in Early Life History Symposium Papers.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Zweifel, James R. and Paul E. Smith. Estimates of abundance and mortality of larval anchovies (1951-1975): Methods and results. For publication in Early Life History Symposium Papers.

Translations

Siebold, P.F. de, C.J. Temminck, H. Schlegel, and W. De Haan. 1842. Les scomberoides. Les serioles (Seriola). Translation of the section on The Amberjacks (Seriola), p. 113-117 in Fauna Japonica 2. (Translated from French by Wilvan G. Van Campen for the SWFC Honolulu Laboratory, Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812, 1979, 3 p.)

Administrative Reports

Honolulu Laboratory

Southwest Fisheries Center Honolulu Laboratory. 1979. Kewalo Research Facility. SWFC Admin. Rep. H-79-11, 31 p.

Evering, George C., Jr. 1979. Seamount fishery, foreign vessel observer report. Aso Maru (May 27-July 10, 1979). SWFC Admin. Rep. H-79-14, 10 p.

Mendelssohn, Roy. 1979. A systematic approach to determining mean-variance trade offs when managing randomly varying populations. SWFC Admin. Rep. H-79-15, 11p.

Gooding, Reginald, M. . 1979. Observations on surface-released, sublegal spiny lobsters, and potential spiny lobster predators near Necker and Nihoa Islands. SWFC Admin. Rep. H-79-16, 8 p.

Weihs, Daniel. 1979. Analysis of energy consumption of tuna swimming in circular tanks, and having artifically increased negative buoyancy. Final Report - Contract No. 79ABA-02421. SWFC Admin. Rep. H-79-17, 13 p.

La Jolla Laboratory

Benirschke et al. A study of nonpregnant dolphins (Stenella longirostris and S. attenuata) possessing corpora lutea. SWFC Admin. Rep. LJ-79-27.

Stuntz, W. and T. Shay. Report on capture stress workshop. SWFC Admin. Rep. LJ-79-28.

Perrin, W. and J. Henderson. Growth and reproductive rates in 2 populations of spinner dolphins, S. longirostris, with different histories of exploitation. SWFC Admin. Rep. LJ-79-29.

MacCall, Alec D. Methods of anchovy biomass estimation and stock assessment. SWFC Admin. Rep. LJ-79-30.

HONOLULU LABORATORY

RESOURCE ASSESSMENT AND DEVELOPMENT INVESTIGATIONS (RADI)

Marine Turtle Workshop Held at Honolulu Laboratory

The "Planning Workshop for NMFS Research on Marine Turtles in the Central and Western Pacific" was held at the Honolulu Laboratory July 31-August 2, to determine what is known of the marine turtle stocks in the Hawaiian Archipelago and in other areas of U.S. jurisdiction. The workshop, which was held to facilitate the development of a planning document identifying research needs, priorities, and estimated costs, also sought to determine how much interest there is in marine turtles in the area.

Participants discussed current turtle regulations in the U.S., reviewed the status of marine turtle stocks in the Hawaiian archipelago, and took an indepth look at the situation facing the green turtle. The conferees also discussed items to be included in the research planning document: long-term objectives, stock assessment needs, and life history and socio-economic studies.

Participants in the workshop included George B. Balazs, Hawaii Institute of Marine Biology; Serge Birk, Marine Resources Division, Palau, Dr. Archie Carr, University of Florida; Dr. Rene Grandperrin, South Pacific Commission, Noumea, Dr. Harold F. Hirth, University of Utah, Robert T.B. Iversen, Western Pacific Program Office, Southwest Region, NMFS, Honolulu (WPPO), Harry Kami, Government of Guam, Ernest Kosaka, U.S. Fish and Wildlife Service, Honolulu; Mike A. McCoy, Micronesian Maritime Authority, Ponape, John J. Naughton, WPPO; Eric Onizuka, Hawaii State Division of Fish and Game; William Pedro, Office of Marine Resources, American Samoa (OMR), Dr. Jeffrey Polovina, Honolulu Laboratory, Southwest Fisheries Center, NMFS (HL), Peter C. H. Pritchard, Florida Audubon Society/Southeast Region Sea Turtle Recovery Team; Richard S. Shomura, HL, Dr. Tim Smith, La Jolla Laboratory, Southwest Fisheries Center, NMFS, Dr. Joseph Sylvester, Southeast Region, NMFS, St. Petersburg, Florida, Richard N. Uchida, HL; Dr. Richard Wass, OMR, and Howard O. Yoshida, HL.

Draft of Precious Coral Management Analysis Presented to Fishery Council

Drs. Michael Adams, Economist, and Roy Mendelssohn, Operations Research Analyst, completed a draft Regulatory Analysis estimating the socio-economic and biological implications of the Fishery Management Council's proposed precious coral management measures. The document was presented to the Western Pacific Regional Fishery Management Council during its meeting in Kailua-Kona, Hawaii, August 22-24, 1979.

Adams and Mendelssohn concluded that the proposed management measures would have essentially the same effect as current Hawaiian regulations.

The Council's plan is preferable to most alternatives considered because it provides a safety margin in the determination of sustained yield, according to the recent analysis. Among other measures, the proposal suggests creating a "disincentive" for new firms to discourage them from exploring for coral around the main Hawaiian Islands.

Townsend Cromwell Continues Survey Cruises

The NOAA research vessel, Townsend Cromwell, returned from cruise 79-03 on August 3 after completing a six-week survey cruise around the Hawaiian Archipelago, according to Insular Resources Task Leader Richard Uchida. Honolulu Laboratory scientists on the cruise included Chief Scientist Fletcher Riggs and Research Assistant Victor Honda, who represented the National Marine Fisheries Service in the cooperative study of the Northwestern Hawaiian Islands, undertaken with the University of Hawaii Sea Grant and the Hawaii Department of Fish and Game.

The first part of the cruise was designed to measure primary and secondary productivity; the objective during the second part was to assess nearshore fish communities and demersal and pelagic resources.

Sea Grant personnel conducted intensive biological sampling, and measured water temperature, salinity, water clarity, nutrient count and uptake, productivity of phytoplankton, abundance of phytoplankton and zooplankton, and searched for larval fishes and other micronekton. Fish and Game scientists made visual surveys to acquire information on species composition and abundance. They also collected biological specimens for laboratory study, and tagged carangid fishes to study their growth and movement.

Honolulu Laboratory staff conducted trapping operations to collect additional data on the distribution and availability of shrimps, Heterocarpus, and spiny lobsters, Panulirus marginatus. The scientists also conducted handline and troll fishing to study catchability, feeding behavior, and spawning of pelagic and demersal fish species.

Samoan Fishery Investigation Cruise Sails

The NOAA research vessel, Cromwell, left Hawaii's Kewalo Basin on August 18 to begin a cooperative cruise, 79-04, with the National Marine Fisheries Service, and the Governments of American and Western Samoa. On board the Cromwell are Chief Scientist Walter Matsumoto, and Research Assistants Bert Kikkawa, Paul Shiota, and Darryl Tagami. The primary objectives of the cruise are to deploy fish aggregation buoys and to survey and assess the demersal and pelagic fishery resources over seamounts, banks, reefs, and offshore fishing grounds in Samoan waters.

The fish aggregating buoys will be deployed around American and Western Samoa and monitored at weekly intervals. Also scheduled are fishing operations using fish and shrimp trawls, handlines, lobster pots, shrimp pots, crab nets, and fish traps to determine the availability, catchability, distribution, and relative abundance of commercially valuable fish and shellfish. The Cromwell is scheduled to remain in Samoan waters until October 13 and return to Kewalo Basin on October 25.

Concepts of Metabolic Rates in Skipjack Tuna Altered as Result of New Study

Working with Dr. Andrew Dizon and his staff at the Honolulu Laboratory during August, Dr. Daniel Weihs of Technion University in Haifa, Israel and NOAA Post-Doctoral Research Fellow at the Southwest Fisheries Center for the past year, has shown that skipjack tuna in the wild do not have considerably higher metabolic rates than other fishes of similar size. Rather than being relatively inefficient in their use of oxygen and food energy, the skipjack tuna may be one of the most efficient energy users of all fishes, at all swimming speeds, according to Weihs.

Weihs, a hydrodynamicist and aerospace engineer, demonstrated that tuna swimming in circular tanks use considerably more energy than do fish in the open ocean and therefore a correction factor must be used on energetics and metabolic data collected on tank-bound fish. After conducting a quantitative hydrodynamic analysis of the forces acting on captive tuna, Weihs calculated a correction factor to be used in compensating for the curved trajectory of the fishes.

The Weihs correction factor will be applied directly to data collected in the laboratory and used by Fishery Biologist Reg Gooding and Dr. William Neil, presently at Texas A&M University, in a draft manuscript entitled, "Oxygen uptake and low-oxygen tolerance limits in unrestrained skipjack tuna, Katsuwonus pelamis."

Gooding has discussed the various implications of this finding with Weihs and present plans are to modify the manuscript with Dr. Weihs as one of the authors.

Tuna Performance Relative to Tank Size Studied

Randolph Chang, Fishery Biologist, has been working with skipjack tuna and kawakawa to compare their swimming performance in tanks of different radii. Preliminary observations confirm that the minimum speed of the fish increases as the radius of the tank is shortened. The fish also bank away from the outer wall of the tank to overcome centrifugal forces when swimming in a circular tank. Overhead photographic records will be used to measure the angle of the banking and the area of lift provided by the pectoral fins.

Honolulu Laboratory Scientists Participate in the 21st Hawaiian International Billfish Tournament

Heeny Yuen, Leader, Recreational Fisheries Task and Research Assistant Robert Humphreys attended the 21st Hawaiian International Billfish Tournament held at Kailua-Kona, Hawaii from August 18 through the 26. Yuen and Humphreys collected catch and effort data and examined the catch to obtain data on length, sex, and stomach contents. Because of a new tournament rule stating that all fish weighing less than 100 pounds would not be officially weighed, the fishermen were urged to tag and release all billfishes in that size category. However, Yuen reported that only two billfishes less than 100 pounds were caught during the tournament. Of these two, both shortbill spearfish, Tetrapturus angustirostris, only one was tagged and released.

Ciguatera Study Continues

Research Assistant Barnard Ito reports that sampling of amberjack, Seriola dumerilii, for ciguatera toxin continues at the United Fishing Agency's auction market. Ciguatera is a potent poison that appears intermittently in some species of tropical fish.

During the period from July 24 to August 24, Ito sampled 174 fish; of these, four were found to have excessive amounts of ciguatoxin in the flesh. The rejected fish ranged in size from 0.91 to 7.37 kg.

Since the sampling program began in April, 580 amberjack have been tested, and 96 fish -- 16.5% -- have been found to be contaminated.

Short Film on Spiny Lobster Predation Experiment Prepared

Reginald Gooding put together a 21-min, 16-mm film entitled, "Lobster trapping at Necker Island and preliminary observations of lobsters released from the surface in the presence of some potential predators," using film sequences taken during a short initial study conducted during Townsend Cromwell cruise 79-02.

Hawaiian Skipjack Tuna Landings Continue Below Long-Term Average

The August 1979 Hawaii landings of skipjack tuna were estimated at 678 metric tons (MT), which is 390 MT above the August 1978 landings and 0.4 MT above the 1948-78 long-term average for August. The cumulative landings from January through August were estimated at 2341 MT, which is 53 MT below the 1978 landings for the same period and 981 MT below the 1948-78 long-term average for the same period.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

Laboratory and Field Handling Techniques on Shrinkage of Larval Fish Studied

Fishery Biologist G. Theilacker has been using morphometric criteria to identify condition of laboratory-reared jack mackerel larvae. To estimate condition of field-collected larvae using the laboratory-determined morphometric criteria, the effects that laboratory and field handling techniques have on larval fish shrinkage need to be determined. In an earlier study with anchovy larvae, Theilacker showed that larvae pipetted directly into preservative (laboratory-preserved) shrink less than larvae that are netted first before preservation ("field-collected").

Theilacker collected jack mackerel eggs during the August cruise of the David Starr Jordan and reared the larva in the Center's aquarium. Larva were sampled for 5 days after yolk absorption. The procedure for treating sampled larva was to either 1) measure live size and pipet directly into preservative (laboratory-preserved), or to 2) measure live size, treat in a collecting net, remeasure, and preserve ("field-collcted"). Jack Metoyer, Biological Technician, assisted with the measurements.

Preliminary results from this initial experiment are: 1) shrinkage increases with increasing net-treatment time (Table 1), 2) laboratory-preserved larvae shrink less in length than "field-collected" larvae (Table 2), and 3) shrinkage of body parts of laboratory preserved larvae is similar in Bouins fixative and formalin (Table 2), however, the additional shrinkage of body parts caused by preservation after net treatment is greater in Bouins than in formalin (10% vs. 3%; Table 1). Not all results are analyzed; this study will be continued when more eggs are collected.

Table 1. Jack mackerel larvae: effect of net-retention time and preservation on standard length measurements. R = treated size divided by live size. No shrinkage: R = 1.00.

n	mean time of net treatment (min.)	R after net treatment	R preserved	
			Bouins	Formalin
23	6	1.00	0.90	0.97
26	10	0.90	0.81	0.87
23	18	0.83	0.74	0.80

Table 2. Jack mackerel larvae: effect of handling and preservation on body part measurements; laboratory preserved vs. "field collected." R = treated size divided by live size.

	R^1 Laboratory preserved		R^2 "Field collected" (18 min. net treatment)	
	Bouins	Formalin	Bouins	Formalin
Standard length[3]	0.90	0.93	0.74	0.80
Head length	0.89	0.90	not analyzed	
Eye diameter	0.90	0.91	not analyzed	
Body depth	0.80	0.80	not analyzed	

[1] n = 17

[2] n = 22-26

[3] mean SL = 3.7; range 3.2-4.4 mm

Juvenile Pelagic Fish Sampled

Richard Methot, employed under contract with the University of California, San Diego, participated in the second of three cruises aboard the Jordan to sample pelagic juvenile fish, which was conducted during August 1979 using a modified Cobb midwater trawl (100 ft. headrope) and a 6-foot Isaacs-Kidd midwater trawl. These two samplers enabled Methot to collect fish from a wide size range (10 mm anchovy larvae to 50 cm bonito). Both nets collected 30-50 mm juveniles of anchovy, jack mackerel and hake.

In 30 tows with the Cobb trawl, cruise participants collected 19 species of fish (excluding rockfish and myctophids). The seven most common species were Engraulis mordax (21 positive tows), Scomber japonicus (16), Trachurus symmetricus (13), Porichthys (14), Merluccius productus (10), Peprilus simillimus (9), and Seriphus politus (7). The maximum catch occurred in Santa Monica Bay (30 min. tow, 90 m water depth) and included 253 kg Engraulis, 149 kg Trachurus, 18 kg Scomber, 16 individuals of Merluccius, 7 Porichthys, 2 Peprilus, and 2 Sarda (bonito). Notable catches were two 50-cm Sarda off oceanside and 11 adult Sardinops off Imperial Beach. Juveniles constituted a much greater fraction of the total Engraulis catch in tows over the 35 m isobath compared to tows over the 90 m isobath. Methot will investigate this steep onshore gradient more thoroughly on the September cruise of the Jordan.

ALBACORE PROGRAM

Researchers Study Warm Blooded Albacore Tuna to Predict Its Whereabouts

A team of marine biologists, oceanographers, and medical technicians have recently made discoveries that help explain how the extraordinary physiology of albacore tuna affects where and when the fish will be found. The commercially valuable albacore or "white meat" tuna, like all tunas, has the unusual distinction of being "warm-blooded" and researchers believe that an understanding of the advantages and disadvantages of warm-bloodedness will better-enable scientists to predict the whereabouts of the fish, and by so doing manage the resource wisely.

With a scientific crew led by Dr. R. Michael Laurs of the Southwest Fisheries Center in La Jolla, the NOAA research vessel David Starr Jordan sailed off the coast of southern California in late July. It was the third in a series of annual albacore "environment/physiology" cruises, and was to investigate the fishes' cardiovascular system, which is specially adapted to circulate warmed blood--it can be 25 to 30 degrees Fahrenheit (12°-15° C) above the temperature of the surrounding waters--to the fishes' cold extremities, while not dissipating its heat into the frigid waters. As part of their investigations, scientists also performed a test to demonstrate that albacore have the ability to regulate their body temperatures; studied the blood chemistry of the fish; and isolated chromosomes for later examination under the electron microscope to determine whether northern and southern albacore in the Pacific breed as one stock or two.

Cruise participants included scientists from the Southwest Fisheries Center, the University of California at San Diego (UCSD) School of Medicine, Scripps Institution of Oceanography, the Scripps Clinic and Research Foundation, and Oregon State University.

"The overall objective of our 'environmental physiology' research on albacore tuna is to provide us with a basic knowledge of the physiology of the fish and its ocean environment," said Laurs in a recent interview. "One of the key factors in the relationship between ocean and fish," he continued, "may be the albacore's unusal adaptation of elevated body temperature and its ability to thermoregulate."

Laurs explained that albacore circulate heat and blood in different manners, yet with the same system. Whereas the blood moves from the warm interior of the fish to the cool gills and extremities, the heat carried by the blood is retained in the warmer areas. Veins and arteries come close together as they pass between the gills and the warm interior, forming what is called a rete mirabile (literally "wonderful network") where the warm outgoing blood transfers its heat to the cool incoming supply. In this way, the heat is retained, while the system still carries oxygen from the gills to the tissues.

Since muscles are more efficient when heated, warm-bloodedness makes tuna one of the most powerful and fastest fishes in the ocean. The elevated body temperature, however, requires energy to produce, which means that the fish must have adequate food, the question researchers have asked is how much. If a fish can be held in captivity, its metabolism can be measured, allowing scientists to determine its food requirements. On each of the albacore cruises, Laurs has attempted to bring back live tuna, in order to develop a method for holding them in captivity and ultimately to measure metabolism and perform other tests which would link the physiology of the fish to its environmental requirements (see photo). Although several fish have been brought ashore, none has survived long enough for testing.

Researchers participating in the July-August cruise aboard the Jordan have made a number of significant findings, according to Laurs. Frank White and Ray Kelly of the UCSD School of Medicine measured heart rates, outputs, and blood pressures of captive albacore held for short periods in specially designed tanks aboard the Jordan. Blood pressure two to three times higher than in other fishes was measured. White and Kelly, believe this high pressure may be an adaptation to the fishes' fast-swimming capability.

In order to measure temperature regulation in the fish, Dr. Jeffrey Graham of the Scripps Institution of Oceanography submerged an albacore in cooled water. In response to the treatment, the fish increased its body temperature. Graham is the first person ever to observe and measure this phenomenon in albacore.

Drs. Frank Conti of Oregon State University, David Morrison of the Scripps Clinic, and Laurs were able to refute a basic belief of fishery biologists by their finding that the highly-evolved tuna have high blood volumes--a trait previously attributed to fish low on the evolutionary scale. Laurs said that other blood studies on this cruise included measurement of its distribution to various organs, and chemical analyses.

Isolation of chromosomes--a difficult task that has only been performed on one other species of marine fish--was carried out aboard the Jordan by Ray Kelly and Mary Garrettson of the UCSD School of Medicine. Using techniques similar to those employed for humans to detect genetic defects in unborn children, the scientists cultured some white blood cells of albacore for shoreside electron microscopy. The characteristic chromosome bands, which are found in all animals and can be used as "fingerprints" for the species, will be compared to those of albacore from northern California, in the hope of determining whether albacore in the eastern Pacific are one breeding stock or two.

"If they comprise two stocks, as I suspect they do, such a finding may have a significant impact on how we manage the albacore resource in the future," said Laurs.

To determine the preferred environment of the albacore, experiments were carried out with the assistance of researchers aboard a second ship, the Linda, on charter to the industry-sponsored American Fishermen's Research Foundation. Dr. Andrew Dizon, a fish physiologist from the Center's Honolulu

Laboratory, was aboard the Linda, from where he attached acoustic transmitters to three albacore and followed their movements with a hydrophone for periods of up to 30 hours. The Jordan worked on a grid-like pattern around the tracked fish, taking measurements of temperature and salinity, and sampling life forms in the surrounding area. Laurs was surprised to find that the fish spent much of their time 100-250 feet under the surface, in water cooler than scientists had thought to be the fishes' preferred temperature.

Laurs said that the cruise had been the most successful of his albacore voyages to date, and that the information gathered will be of significant help in the Southwest Fisheries Center's ongoing studies to predict albacore distribution and abundance.

Laurs attempts to resuscitate an albacore tuna in the Scripps "donut" tank.

HP-XBT Interface Program Developed

Oceanographer Ken Bliss developed a program on the Hewlett Packard 9825 computer to collect, process, and store data from XBT's. The XBT recorder is linked to the computer via an analog-to-digital converter and interface bus. During a cast, data are received by the HP 9825 at specified intervals and

converted to engineering units. Immediately following the cast, the data are stored on tape and listed on the printer. The system is being tested on Dr. Paul Smith's cruise, with the assistance of personnel from Sippican Corporation, the XBT manufacturer.

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In cooperation with Jack Brown, Bliss developed a program to transfer free-fall particle counter data from the data collection unit to the HP calculator, following each cast. Plots of cells-per-milliliter against depth for specified channels are then immediately graphed on the HP plotter for analysis.

* * * * * * * * * *

Bliss also made preparations for a September cruise from Kodiak to Seattle aboard the NOAA vessel, Surveyor. The cruise will entail two weeks of CTD, XBT, and albacore trolling operations.

MULTISPECIES TAXONOMY

Moser Participates in U.S.-U.S.S.R. Workshop on Systematics of Cold Water Fishes

Dr. G. Moser, Leader of the Multispecies Taxonomy group at the La Jolla Laboratory participated in a U.S.-U.S.S.R. workshop on the systematics of cold water fishes of the world oceans held in Orono, Maine, August 4-6. Soviet fishery biologists and ichthyologists and about 30 American scientists gave papers on a variety of problems concerning cold water fishes and fisheries. Discussion sessions followed the papers and presentations and progress was made toward a potential interchange of specimens, data and scientific ideas.

* * * * * * * * * *

Work continued on initial entry of egg and larva data using the MIDAS system. Fish identifiers in the Multispecies Taxonomy group worked with programmers to improve the revised flexible disc entry program.

* * * * * * * * * *

Sandra Paez, NOAA Junior Fellow, assisted the staff of the Multispecies Taxonomy group by sorting neuston samples for fish eggs and larvae and

curating and reorganizing the juvenile reference collection into the Nelson system of classification, during the period June 15-July 18.

A high school student, Bao Nguyen, served as a summer assistant under the government-sponsored REGY program in Dr. Moser's laboratory. Nguyen sorted and assisted with curating of fish collections and also helped to prepare illustrations of fish eggs and larvae.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Aerial Spotter Program Documented

J. Caruso, Computer Programmer, is preparing a technical report entitled, "Aerial Monitoring of Southern California Pelagic Fisheries: A Data System." It will serve as a document to be distributed to others interested in using the aerial spotter data for various related studies. The report will review the kind and quality of data recorded on the logs by the spotter pilots, outline the computer system for the data management, and indicate who potential users should see to access the data.

Scientific Background Papers on Anchovies Prepared for September Meeting with Mexico

Dan Huppert, Gary Stauffer, and California Department of Fish and Game (CF&G) personnel prepared a series of four papers on the northern anchovy resource and its fishery for the upcoming September scientific meetings in Mexico. These review papers are "Characteristics of the anchovy resource and fishery," by Huppert; "United States statistics concerning the northern anchovy fishery," by Herb Frey (CF&G), "Methods of anchovy biomass estimation and stock assessment," by Alec MacCall (CF&G), and "Review of yield estimates for central subpopulation of northern anchovy," by Stauffer. Mexican scientists are writing similar papers.

English and Spanish versions of each paper are being prepared and will be forwarded to the two delegations in advance of the meetings. The objective of the meetings is to review the investigations on the anchovy resource and its fisheries off the coasts of Mexico and the United States. Participants will prepare a joint statement of the conclusions of the meeting, which they hope will serve as a basis for subsequent meetings dealing with the issues of resource management of the anchovy stocks north and south of the border.

Staff Changes Made in Program

In early September, Joe Caruso will transfer to the data management section of the tuna/porpoise program. This promotion should broaden Caruso's experience for continued career development.

* * * * * * * * * *

Another California Fish and Game Biologist, Doyle Hanan, has been assigned to work under Alec MacCall. His initial assignment is to update the estimate of natural mortality for anchovies using age composition data for recent years. He is also scheduled to begin an analysis of the anchovy logbook data to determine whether the available CPUE data can provide a useful index of abundance.

Jack Mackerel Plan Set for Public Hearings

The draft Jack Mackerel Fishery Management Plan was accepted for public hearings by the Pacific Fishery Management Council on August 10 at San Jose. The plan will now be printed and distributed widely for public review. Hearings are scheduled for November and are expected to be held in conjunction with the Groundfish Management Plan.

Midwater Trawl Used for Collecting Marine Organisms

The staff of the Coastal Division at the La Jolla Laboratory use an array of specific samplers for collecting marine organisms ranging in length from about 20 micrometers (.00004 inch) to 20 centimeters (8 inches). Figures 1 and 2 illustrate samplers for larger organisms; figures 3 and 4 picture the net used for smaller marine life. The largest sampler is a 15-meter midwater trawl, which has fine netting for capturing euphausid shrimp (longer than 2 cm), larger anchovy (longer than 3 cm), adult squid, and juvenile jack and Pacific mackerels (up to 20 cm long).

Nine people take part in the trawling operation: the mate or watch pilots the ship; a seaman or the watch operates the winch's controls; the engineer monitors the engines and generators; the oiler watches the winch operation below deck, and the boatswain, a seaman, the trawlmaster, and two of the scientific staff deploy and retrieve the trawl. The scientists also sort, measure, and document the catch.

Scientists, technicians and crew of the Jordan work together to retrieve the net. Trawling is done at night when marine organisms cannot see and thus avoid the net.

The Isaacs-Kidd Midwater trawl shown here being retrieved by at left, Rick Methot and right, Gary Stauffer, is used for taking quantitative samples of large zooplankton and small fishes. The two-meter mouth captures fish up to 3 cm and retains fish and zooplankton 1 cm and shorter. The mesh is 2 mm.

Pictured from left to right are: Dr. Paul Smith, Jane McMillan, Rick Methot and Bill Flerx examining and packaging anchovy samples from the catch.

Paul Smith and Gary Stauffer wash the plankton into the container.

Oceanic Fisheries Resources Division

TUNA AND BILLFISH RESOURCES PROGRAM

Scientist Attends Foreign Fishery Observer Program Meeting

Al Coan, Mathematician, traveled to the Pascagoula, Mississippi, to attend a foreign fishery observer program meeting July 23-25 hosted by the Pascagoula Laboratory. The meeting was called to finalize the format for forms used to collect data from Japanese longline vessels fishing within the fishery conservation zone in the Gulf of Mexico and off the U.S. east coast.

The meeting resulted in the development of data formats for vessel quarterly reports, which will provide catch and effort summary by day, vessel, and area. Participants also developed observer data load forms, which is essentially a single set summary giving gear characteristics, environmental data, and biological data on the fish caught.

Environmental Data Used by Center Scientists to Locate Skipjack

Richard Evans, Oceanographer at the La Jolla Laboratory, is working in collaboration with Dr. Doug McLain, Pacific Environmental Group, and Roger Bauer of Compass Systems, to identify those areas in the tropical Atlantic where skipjack tuna are likely to be available to purse seiners and pole-and-line fishermen. Their approach combines information on physiological limits (water temperature and dissolved oxygen), and environmental limits placed on fishing operations (wind speed, sea state, etc.) to identify areas likely to be fishable by purse seining and baitboat operations.

Evans, McLain and Bauer have assembled available environmental data for the Atlantic between 40° N and 40° S and have plotted the various parameters by one degree square. Preliminary anlysis of the environmental fields is under way. The data will eventually be combined with skipjack catch distribution data to produce contoured plots for evaluating skipjack tuna availability to surface fishing gears.

The approach according to the authors shows promise. Those areas where catches are traditionally high appear to coincide with areas of low surface wind speed, a shallow surface swimming layer and substantial upwelling.

The results of this study might be useful in identifying areas where exploratory fishing should be undertaken by ICCAT's International Skipjack Year Program.

Swordfish 'At-Sea' Sampling Program Resumes for 1979

A swordfish observer program that began in 1978 is continuing this year, according to Earl Weber, Fishery Biologist who is in charge of the program. The program resumed in August 1979 with the placement of the first fisheries technician aboard a commercial harpoon swordfishing vessel. Tuna fisheries technicians will be placed aboard commercial vessels throughout the fishing season to collect biological specimens and data. Technicians will also sample swordfish landings in southern California ports. Dressed fish will be measured and weighed at the landing sites, and this information will be combined with supplemental data obtained at sea to provide estimates of live lengths and weights for the landed, dressed fish.

To date swordfish fishing has been poor and most of the fleet is inactive awaiting improved fishing conditions.

Pacific Fishery Council Suspends Development of Billfish Plan

The Pacific Fishery Management Council postponed further development of the Pacific Billfish Fishery Management Plan, according to billfish team member Jim Squire. The Council's Scientific and Statistical Committee (SSC) recommended the action at the August 9 meeting, in light of the current judicial dispute over California's right to enforce regulations in the 3-200 mile zone. The SSC suggested postponement of the plan, pending settlement of the issue.

The SSC urged the Council not to develop the billfish plan should the State retain management authority beyond the three mile zone, because the management issues are socio-economic and principally involve California citizens. If the State loses authority the Council can reconsider the need for a plan at that time.

Noting that billfish are highly migratory and will require broad international support to assure their conservation, the SSC recommended that the Council bring the matter to the attention of the Secretary of Commerce with the aim of establishing mechanisms for international management.

Tuna Vessel Participation in FAX Advisory Program

During July 1979, 23 tuna seiners contributed synoptic weather data to the NMFS FAX Advisory Program. A total of 198 weather and 2 XBT observations was reported via NMFS-licensed radio station WWD. The following table lists program participation during July 1978 and 1979.

	JULY 1978	1979
Number of vessels with equipment	50	44
Number of vessels reporting	22	23
Number of weather observations reported	173	198
Number of XBT observations reported	46	2
TOTAL OBSERVATIONS	219	200

Leading all program participants this month were the captains and crew of the Santa Rosa, Marietta, and Claudia B, to whom thanks are due.

Fishing Information to be Available Nationally

In response to public demand, the Southwest Fisheries Center's monthly publication, Fishing Information, edited by Fishery Biologist Jim Renner, has been selected for publication by the federal National Technical Information Service. It will be available on microfiche and hard copy.

Fishing Information catalogs and graphs sea surface temperatures and other environmental data useful for locating fish in the open ocean. It has been used by oceanographers and meteorologists for almost two decades as a vital data source of long-term temperature changes in the eastern Pacific Ocean.

MARINE MAMMAL ASSESSMENT AND MONITORING

Workshop Held to Assess Status of Porpoise Stocks in Eastern Tropical Pacific-- Preliminary Reports Indicate Several Stocks at Lower Levels Than in 1976

Based on better and more abundant data than in 1976, participants at the Workshop on the Status of Porpoise Stocks held at the Southwest Fisheries Center, August 27-31, have preliminarily concluded that earlier estimates of the number of porpoise were too high and that the recruitment to the porpoise populations was also overestimated. A final report, prepared by Dr. Tim Smith, the Convenor of the Workshop, and embodying the findings and recommendations of the experts who took part in the Workshop is scheduled for completion in late September. The report, after review by NOAA and the Department of Commerce, will be released to the public.

Internationally-known and respected experts on cetacean biology and population dynamics who gathered at the Center for the week-long meeting reviewed available information on reproductive biology, present population sizes, and the history of incidental mortality, to arrive at the best possible assessment of the current status of the several stocks of porpoise involved in the purse seine fishery in the eastern tropical Pacific.

According to Smith, this workshop was similar to one convened in July of 1976 when the status of porpoise stocks was determined following a judicial decision which invalidated existing permits for incidental take of porpoise by the U.S. tuna purse seine fleet.

Based on these findings, it appears that regulations and quotas already estabished for 1980 may be modified.

Documents on Porpoise Population Size and Incidental Kill Prepared for Workshop

A number of documents were prepared by staff members of the Marine Mammal Assessment and Monitoring Program for the Status of Porpoise Stocks Workshop.

R. Holt, Operations Research Analyst, and J. Powers, former Leader of the Marine Mammal Assessment and Monitoring Program, completed a working document detailing the estimation of current abundance of porpoise populations. The estimates are based primarily on aerial and surface surveys conducted in 1977 and 1979, and secondarily on information from tuna vessel observations. The abundance estimates are generally lower than those used previously (which were based on 1974 field work), and represent a substantial improvement in methodology and sample size. Principal areas of improvement in methodology include photographic validation of visual school size estimates, and direct estimation of perpendicular distances of schools from the flight path.

Drs. N. Lo, Statistician, and T. Smith, Fishery Biologist, completed a working document, "Estimation of incidental mortality of porpoise associated with the yellowfin tuna purse seine fishery, 1959-1972," SOPS/79/27. The paper reestimates incidental mortality of offshore spotted and eastern spinner dolphin from 1959 to 1972.

Lo and Smith drew information from several previously unused porpoise kill observations made in the 1960s.

The new incidental kill estimates are generally lower than similar ones made during the 1976 workshop.

The paper describes the statistical properties of the new estimates, and includes an estimation of the variances and covariances of all of the 14 annual estimates for each porpoise population.

Fishery Biologist Eric Barham completed a working document, "Grampus griseus: A possible index form for aerial surveys of dolphin populations," (SOPS/79/23), which analyzes aerial and shipboard sighting data for Grampus

griseus as a possible useful reference-species for strengthening the estimates of other species. Barham's paper provides a description of the data and procedures, and reviews some density estimates.

Operations Research Analyst David Au, Supervisory Fishery Biologist William Perrin, and Lt. Wayne Perryman completed a working document, "Dolphin distribution and the relationship to environmental features in the eastern tropical Pacific (SOPS/79/36)," describing the historical ranges of the several porpoise populations, based on past sighting records and oceanographic features of the area. The paper states that the boundaries for many of the stocks have changed, and describes centers for new stocks.

MARINE MAMMAL BIOLOGY AND TECHNOLOGY PROGRAM

Manuscripts Prepared for Status of Porpoise Stocks Workshop

William F. Perrin, Supervisory Fishery Biologist, and John R. Henderson, Fishery Biologist, completed three reports on the life history and gross annual production of various porpoise stocks. These reports were used during the Status of Porpoise Stocks Workshop held at La Jolla August 27-31. One of them, "Growth and reproductive rates in two populations of spinner dolphins, Stenella longirostris, with different histories of exploitation," is particularly relevant, as porpoise stock assessment in the past has been based upon a model of density-dependent change in net reproductive rate. The eastern spinner dolphin population is estimated to be at a lower fraction of original size than is the population of whitebelly spinner dolphins. Higher reproductive rates would be expected in the former than in the latter on the basis of the density-dependence model. The manuscript reports that, based on analyses of over 4,000 specimens collected through 1978, 1) there is a relative paucity of fully adult males in the eastern population (possibly indicating lower average fertility), 2) the eastern spinner female attains sexual maturity about one tooth-layer unit (probably one year) earlier than does the whitebelly spinner, 3) ovulation rate and pregnancy rate in young females are lower in the eastern population (possibly because of the low number of fully-adult males) and 4) the proportion of all females which are sexually mature is lower in the eastern population (possibly indicating a shift in age structure toward younger animals). Gross annual reproductive rates are not different in the two populations (about 8-10% in both cases), and the results of the comparison do not confirm the assumption of density-dependent increase in gross reproduction.

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Manuscripts were also prepared for the workshop by Dr. Warren Stuntz, on unobservable stress-related mortality of dolphins in the tuna fishery, and by Jacqueline Jennings, reporting preliminary results of tag returns from a tagging experiment in the ETP in October 1978.

Radio-Tagged Dolphin Resighted in Hawaii

A local fisherman sighted a transmitter-bearing spotted dolphin off Oahu, and thanks to publicity efforts of the Center's Honolulu Laboratory, reported the animal's location to the National Marine Fisheries Service. The dolphin, an adult female, was captured and outfitted with the bright orange pack on May 21, 1979 off Barbers Point, Oahu, as part of a test using satellite-linked telemetry to study the movements of dolphins. Although the transmitter failed shortly after release in May, the dolphin was monitored visually for the remainder of the one-week test to assess tag retention and to note any adverse effects on the dolphin carrying the transmitter.

This month the Honolulu Laboratory placed notices in several local newspapers displaying a picture of the transmitter and requesting any sighting information. This publicity paid off when, on August 14, 1979, the fisherman reported having seen the tagged dolphin off Barbers Point, Oahu, apparently not far from where it was tagged. According to the report relayed to Jaqueline Jennings, Leader of the Marine Mammal Tagging and Tracking Project, the animal appeared to be acting normally and was part of a school of dolphins, probably the school it was in when tagged. This school has an apparent home range along the Waianae coast of Oahu, from Barbers Point to Kaena Point.

This resighting, after an interval of nearly 3 months, bodes well for future studies, as the hydrodynamic modification to the radio pack and the attachment module are now known to be satisfactory for long-term monitoring. Furthermore, the fact that the tagged animal was observed with a school indicates that any effect upon the social behavior of these dolphins by the presence of a transmitter is probably minor.

Second Leg of Cooperative Research Cruise Commences

The M/V Cabrillo, carrying Biological Technician Michael Deerman, sailed on August 18, 1979 for the eastern tropical Pacific on the second leg of a cruise to further investigate the dynamics of an enlarged tuna purse seine. During the time the ship was in port, NMFS technicians and the vessel's crew added two strips of webbing to the net, deepening it by 10 fathoms (60 feet). Using bathykymographs to record fishing depth, and a prismatic rangefinder to measure surface distances, researchers in the technology project hope to understand better the effects of depth of a purse seine on the volume it encloses.

Preliminary analyses of data from the first leg indicate that the measurements being recorded are accurate and repeatable. This study will determine both the fishing efficiency of a deeper purse seine as well as the effect of increased volume in the net, a factor that may help reduce incidental dolphin mortality.

PACIFIC ENVIRONMENTAL GROUP

FISHERY ENVIRONMENT MODELING AND FORECASTING

PEG Oceanographer Participates in Equatorial Shuttle

During May 10 to June 9, 1979, Oceanographer Dave Husby of PEG participated as Chief Scientist on Leg 4 of the Equatorial Shuttle between Honolulu and Tahiti aboard the Texas A&M University R/V Gyre. The Shuttle is a portion of the NORPAX Equatorial Program funded by the National Science Foundation to study long-term variations in the flow of the equatorial current systems. The fundamental hypothesis of the NORPAX Equatorial Program is that variations of large-scale zonal currents in the central tropical ocean, induced by low frequency fluctuations in the trade winds, cause large-scale changes in the heat content of the upper layers of the eastern tropical Pacific. Knowledge of the equatorial currents and their variations in time will be of increasing importance in understanding changes in the distribution and abundance of marine life in the area.

The basic observational program in the Equatorial Shuttle consists of repeated hydrographic sections along 3 lines of longitude between Honolulu and Tahiti to measure the transport of the major equatorial currents. The program will provide measures of the equatorial currents every 30 days for at least 16 months (January 1979 - June 1980) to provide a time series record long enough that significant fluctuations may be observed. In addition to making basic CTD casts at each 1° latitude interval, the surveyors are dropping XBT's at alternate 1 degree intervals of latitude, making weather observations, taking direct current measurements, surveying nutrient chemistry, making C_{14} studies, and performing mid-water trawls.

Participating scientists are from the National Marine Fisheries Service, Texas A&M University, the University of Hawaii, Scripps Institution of Oceanography, and Woods Hole Oceanographic Institution.

TIBURON LABORATORY

System Being Developed to Process Data Collected from Commercial Rockfish Fisheries

Candis Cooperrider, Biological Technician, is developing a system to edit and compile data from commercial fishery landings of rockfish. The resulting system will present data in a form that is needed for stock assessment as well as provide information that is needed to improve the efficiency of basic fishery statistics collections.

The system is designed to process the sample data of the commercial fishery collected since June 1977 by the California Department of Fish and Game under contract to the National Marine Fisheries Service. Cooperrider has organized the data into five categories, each representing one (or a combination of) major northern California fishing ports: 1) Monterey, 2) Half Moon Bay and Bodega Bay, 3) San Francisco, 4) Fort Bragg, and 5) Eureka and Crescent City. For each of these categories, monthly and quarterly catches are represented by species, sex, age and length compositions. The system calculates estimates of the total catch, variance of the catch, and within-trip and among-trip components of the variance for each species, sex, length, and age. Annual length and age frequencies by species and sex are plotted on microfiche.

Data will also be compiled by area of catch rather than port of landing in an attempt to reduce sample variances. Since fish caught on a trip may come from several areas, and samples are assigned to a California Department of Fish and Game statistical block according to location of the largest catch made on a trip, it is not clear that stratification by catch area will reduce the variance.

Changeable Nature of Subtidal Habitats Often Ignored

Baseline studies of California subtidal habitats often do not take into account the environment's everchanging condition, and could prove detrimental if relied upon to shape environmental policy, according to Fish Communities Task Leader Dr. Edmund S. Hobson. Change is a natural condition of subtidal habitats, and although some change is seasonal and recurrs annually, much of it follows longer, irregular patterns. This finding has been documented in long-term studies by the Fish Communities Task.

In monitoring certain habitats since 1972, Hobson and Fishery Biologist Tony Chess have found that much of the environmental change relates to characteristics of the predominant biological features: the kelps (see photo) entire substrates are periodically swept away as these plants progress through their normal life stages.

Hobson believes that studies to monitor subtidal habitat should incorporate into their design an understanding of how the habitats change. Too often this is not done. For example, many Californian subtidal habitats have been characterized in recent years by so-called "baseline" studies that claim to provide means to recognize and measure subsequent unnatural disturbances. These studies, however, have tended for a variety of reasons to be short-term. Many have described conditions at one point in time, and few have been extended beyond one year. Obviously, such short-term efforts cannot characterize changeable habitats.

Even defining a change that follows an annual cycle requires multi-year study to determine recurrent patterns. Longer-term, irregular patterns, which strongly influence subtidal habitats in California, can be characterized only by understanding the interacting processes involved--a complex task that could take many years.

Figure 1. This Californian subtidal habitat is one of several under long-term study by Tiburon's Fish Communities Task. It exemplifies the dominance of algae in most nearshore habitats in these waters.

FISHERIES DEVELOPMENT INVESTIGATION

Shark Age Verification Study Undertaken

Tiburon Laboratory staff began tagging leopard sharks (Triakis semifasciata) San Francisco Bay this month for age verification studies. Fishery Biologist Susan Smith is injecting field-tagged Triakis with the fluorescent compound oxytetracycline to determine from long-term recaptures whether growth layer rings on the vertebral central are annual, and thus useful for age determination.

In spite of continual boat engine problems which at first hampered and later completely halted field operations, 2,621 longline hooks were set, and 495 Triakis were tagged, injected and released. During the latter part of the month, when Tiburon's research vessel Portola broke down completely, the project was fortunate to obtain another vessel on loan from the National Ocean Survey's Pacific Hydrographic Party.

So far, the longline gear has produced a mean catch rate of 42.3 elasmobranchii (all species combined) per 100 hooks, and a mean rate of 18.9 Triakis per 100 hooks. Other elasmobranchii taken by the gear were brown smoothhound (Mustelus henlei), bat ray (Myliobatis californica), seven gill shark (Notorynchus maculatus) and soupfin shark (Galeorhinus zyopterus).

Salmon Delivered to Tiburon Laboratory

King salmon that had been reared at the Feather River Fish Hatchery in northern California were delivered to the Tiburon Laboratory on August 20 and 21, in six groups. Half of the fish have been "imprinted" by being raised in water treated with a chemical scientists hope the fish will recognize later as characteristic of their spawning grounds. Two groups of the salmon were released as controls from Tiburon immediately after delivery, one each from the imprinted and non-imprinted halves. The remaining salmon were placed in four floating pens, two or which were outfitted with a drip system for further chemical imprinting.

Tag Returns

Approximately 40 recaptures of our nose-tagged king salmon from 1978 were reported in California Department of Fish and Game port samples.

PHYSIOLOGY INVESTIGATION

Benzene in Bass Eggs Improves Hatching Survival But Decreases Larval Survival

Striped bass eggs exposed to low level concentrations of benzene (100-320 ppb) exhibited greater survival to hatching than unexposed eggs, but a greater proportion of the larva died in later development, according to preliminary results of a study done by Mickey Eldridge and Pete Benville of the Tiburon Laboratory. Benzene also accelerated hatching time three to four hours, and caused a lower survival rate among starved larva. Unexposed starved larva outlived those exposed by four days.

These findings are part of a recently concluded study on the effects of exposing bass eggs, prefeeding larva, and feeding larva to low levels of benzene. The laboratory analysis is as yet incomplete.

As gauged by oxygen consumption, benzene depressed embryo metabolism, whereas later larval stages (up to 29 days after fertilization) appeared consistently to have elevated oxygen consumption rates, and so presumably higher metabolisms.

The researchers monitored the uptake, accumulation, and disposal of C^{14}-benezene, in conjunction with other measurements. Aqueous phase benzene entered and left tissues rapidly, usually within six hours of treatment. In all stages of early develoment, the striped bass gradually and steadily accumulated C^{14}-benzene and its metabolites. Eggs had final concentrations of 4 ppm; prefeeding larva accumulated over 8 ppm; and feeding larva took in 240 ppm. Starved larvae accumulated less (170 ppm), thereby indicating that a pathway for the contaminant is through food.

Yet to be analyzed from this experiment are sublethal effects as measured by growth, energetics, and histopathology.

Subadult and Juvenile Bass Subjected to Benzene Study

Nina Hirsch and Richard Pimentel (both on contract from San Francisco State) conducted an experiment to test the effect of a low concentration of benzene (100 ppb) on subadult and juvenile striped bass. The fish were exposed for four weeks, approximating chronic levels in San Francisco Bay. (Benzene and other alkylated aromatics have been identified in wild striped bass from the area).

Researchers conducted autopsies on some of the fish after two and four weeks of exposure, and after two weeks of depuration. Samples were taken for analysis of uptake and for tissue level effects. In addition to sampling the tissues measured in field-sampled bass, Hirsch and Pimentel are taking samples from adrenal glands, gills and spleen.

Noting that leukemia and other blood afflictions are among the best-documented ailments in mammals exposed to benzene, the researchers made blood prints of spleen and kidney tissue, and made standard blood smear slides. Other tissues will also be studied for effects of low levels of benzene on striped bass in non-spawning stages. Analysis of the samples and data from this experiment is under way.

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Physiology Investigation Group staff are continuing to analyze data collected during the 1979 spawning season from prespawning striped bass. The researchers are analyzing the samples for petroleum-derived aromatic hydrocarbons and other pollutants, and are coding the data for further analysis.

Researchers have also nearly completed analyzing data from samples of striped bass collected during 1978. They report having completed a factor analysis, and say they are in the process of applying regression analysis to the data.

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS

ORION Project Progresses

The Oceanographic Research Interactive Onboard Computer (ORION) steering committee met on August 1, 1979 to discuss the progress of the shipboard computer system for the R/V David Starr Jordan. Meeting participants decided that the CalCOFI subsystem would be implemented first on the ORION system with the target date for the testing and implementation in December 1979.

Programming was completed for the analog-to-digital computer, whose programs simulate the reading of shipboard sensors to expedite the development and testing of the ORION system at the Center.

ADP employees made an on-line demonstration of the network controlling executive program and the CalCOFI data collection software. The programs appeared to be well developed, requiring only minor additions.

Other Data Management Activities

Oden Burris, Computer Programmer, has been assigned as the Financial Reporting Systems (FRS) technical consultant for the Southwest Fisheries Center and the Southeast Region.

John Laird and Katherine Paine of the Northeast Fisheries Center visited the Center from August 27 through 30, 1979 for a technical training session of the Northeast Fisheries Center's FRS system.

Fred Kellenberger reports that the ADP group will generate vessel reports for William Briggs, Planning Officer, Port of San Diego, Unified Port District. The reports will help Briggs project requirements for slip space. Pat Grise from the California Coastal Commission has requested similar reports for the analysis of slip requirements for all of California. Oden Burris will be generating these reports for Mr. Briggs and Ms. Grise on the Burroughs 7800.

Dorothy Roll reviewed Robert Butler's documentation of 9 programs and subroutines for the porpoise edit software package, and released them to Chuck Oliver, Porpoise Data Manager, for review. In addition to this set of 9, Oliver is currently reviewing a set of 7 other programs and subroutines.

At the close of business on August 3, the University of California, San Diego Computer Center "powered down" the Burroughs 7800. The expected completion date for modification and repairs was August 13. During the 9-day period, there were no computer services. The B7800 operated intermittently for the rest of August due to hardware problems. The Burroughs engineers have been called and normal operations should resume in early September.

Fred Kellenberger attended a meeting in Terminal Island with California Department of Fish and Game (CF&G) and Southwest Region personnel on August 28, 1979 to discuss the NMFS/CF&G Pacific Area Cooperative Enforcement System (PACES) for FY 80. Conferees determined that the system will be fully operational by November 1, 1979.

The Southwest ADP Requirements study should be completed by September 1979 for review by Southwest Fisheries Center and Region staff. The study outlines and makes recommendations for ADP computer needs in the Southwest.

During August, the system of plotting programs utilizing the INFONET DISSPLA Plotting Package was completed. The system will be used by the International Whaling Commission and the Marine Mammal Data Management Group. The system takes geographic sightings and related data and generates various displays. It will be documented in September.

Clarence Pautzke of the Pacific Marine Fisheries Commission interviewed personnel from the La Jolla Laboratory, Tiburon Laboratory and Regional Office to determine coast-wide data needs. The Commission has a contract with the Northwest Region to interview federal, state and other personnel on the Pacific Coast to determine what data is needed for the entire coast.

Fred Kellenberger attended the Pacific Marine Fisheries Committee on Goals and Guidelines for Regional Fisheries Data Consolidation, in Portland, Oregon on August 21 and 22, 1979. The Committee reviewed the Northwest Region contract.

Work continued on the Billfish Data Base System in August. The system will contain dates and releasing data on billfish. ADP staff designed and created the address data base and release data base and plan to set up the recovery data base in September. There are about 1600 address records, 26,000 release records and 260 recovery records in the Billfish Data Base System. ADP head Fred Kellenberger hopes that the system will be implemented by early October 1979.

IN MEMORIAM

With great sadness we announce the sudden death of our dear, close friend and colleague, Elbert Halvor Ahlstrom, on Monday, August 27.

Among the many tributes to Ahlie, as he was affectionately known to many of us, is one written by his close friend of many years, Professor John D. Isaacs, Director of the Institute of Marine Resources, University of California, which to us summed up warmly and expressively the essence of Ahlie's unique contributions to fisheries science.

As published in the Scripps Institution of Oceanography Log, Professor Isaacs wrote as follows:

"Ahlie succumbed to a heart attack Monday evening, bringing to an end a remarkably productive career, spanning almost exactly forty years of research in the National Marine Fisheries Service and its antecedents. Ahlie was vitally conscious of "the wonderous diversity of plant and animal life in the sea; a range in size from viruses to whales; a diversity of habitat from the shoreline to the abyssal deeps, from the surface film through all levels of the ocean's provinces..." (Ahlstrom, 1952). Out of this "wonderous diversity" and from his strict sense for meaningfulness of research, Ahlie selected for his penetrating scrutiny the eggs and larvae of pelagic fishes, as well as those of some of the more numerous fishes of the bathypelagic zone. It was a prescient decision, but an arduous task. Identification was difficult; prior work was scarce. However, Ahlie's confidence was soon vindicated--this was a sensitive and meaningful entree into the poorly known population dynamics of pelagic fishes and at extremely crucial moments in their life histories: spawning, birth and early development and survival. His work

became a milestone and his findings one of the few certainties in the field of marine fisheries. A career may be measured by the honors accorded, and Ahlie received many. But a career must ultimately be measured by its impact and Ahlie's work laid new foundations for fisheries science. Important national and international programs with increasingly important findings follow his leadership and his teaching. This influence will continue but Ahlie and his personal contributions will be sorely missed.

AWARDS

The following were presented NOAA awards at a general meeting at the Southwest Fisheries Center on August 22, convened by Deputy Director John Carr. Pictured left to right are Charles O'Connell, Norman Bartoo, Scott Johnson, Bob Nydam, Carol Kimbrell, Jack Metoyer, and Julie Shoemaker. Not pictured: Bill Flerx, Bob Counts, and Sue Steele.

Shellfish Library Donated to Tiburon Laboratory

On August 1, during a ceremony at the Tiburon Laboratory, Dr. Victor L. Loosanoff, 80, a pioneer researcher in shellfish biology for half a century, contributed his extensive personal library of scientific reprints and journals to the Center's Tiburon Laboratory. Loosanoff, widely known for his research on shellfish aquaculture, was a Senior Scientist at the Tiburon Laboratory from 1962 to 1965, when he retired from government service.

Born in Kiev, Russia, Loosanoff received his undergraduate degree from the University of Washington and his doctorate from Yale University. He entered government service as an aquatic biologist with the U.S. Fish and Wildlife Service, serving as the Director of the Marine Biology Laboratory in Milford, Connecticut for 27 years.

The collection of publications which Loosanoff donated to the Tiburon Laboratory contains bound volumes of more than 10,000 reprints, the majority dealing with bivalve mollusks--oysters, clams, cultivation and predator control. Loosanoff presently lives in Greenbrae, California, a few miles north of the Tiburon Laboratory.

In accepting the library for the National Marine Fisheries Service, Director Norman Abramson of the Tiburon Laboratory pointed out that the Loosanoff collection is unique and would be difficult to duplicate any where in the world. "For researchers, industry, and the interested public, this fine collection provides a much needed base of knowledge for cultivating important and valuable food items," said Abramson.

From left to right: Norm Abramson, Director of the Tiburon Laboratory, Dr. Loosanoff and Maureen Woods, Librarian at Tiburon Laboratory, inspect the collection of bound volumes.

At the presentation, Dr. Joel Hedgpeth, famed marine biologist and editor of "Between Pacific Tides" spoke in honor of Dr. Loosanoff.

PRESS RELEASES

August 8 - "Northwestern Hawaiian Islands fishery resources surveys continue."

9 - "Porpoise back pack sought."

PUBLIC RELATIONS

Honolulu Laboratory

August 19 - Heeny Yuen appeared on Bruce Carter's TV show "Let's go fishing," to publicize the attempts to retrieve the transmitter attached to a porpoise by Jackie Jennings, SWFC, La Jolla.

Tiburon Laboratory

August 25 - Daniel Ralph, Fishery Biologist, and Lt. Patrick Rutten, NOAA Corps, led a group of San Francisco Tyee Club members and guests on a tour of the Tiburon Laboratory and the experimental salmon-rearing facilities.

SEMINARS

August 8 - Dr. Paul Smith, Fishery Biologist, gave a talk entitled, "Anchovy production and primary production."

16 - Barry J. Richardson of the Department of Biological Science, Australian National University, presented, " A critical analysis of the genetic data collected during the first two years of the South Pacific Commission Skipjack Survey and Assessment Programme."

23 - Dr. Edmund S. Hobson of the Tiburon Laboratory participated in a Sea Otter Workshop at the Museum of Natural History, Santa Barbara, California, where he presented a talk on "The Changeable Nature of Californian Subtidal Habitats."

VISITORS

Honolulu Laboratory

August 3 - Tony Jones, Laurence Berkeley Laboratory, University of California, Berkeley, visited H. Yuen.

6 - Paul Haraguchi of Pacific Weather, Inc., a Honolulu consulting company, visited R. Shomura to seek business contacts for the company's meteorological consulting services.

- Brooks Takenaka of United Fishing Agency, Honolulu discussed "burnt" tuna with R. Shomura.

7 - Peter Saul, Biologist, New Zealand Ministry of Agriculture and Fisheries visited H. Yuen.

8 - John C. Marr, Executive Director, Western Pacific Regional Fishery Management Council discussed the Council's Scientific and Statistical Committee with R. Shomura.

14 - Bob Gillett of the South Pacific Commission Skipjack Programme, Noumea, New Caledonia visited R. Shomura and also spent several days in the Honolulu Laboratory library to search out several "obscure" publications on western Pacific skipjack tuna.

La Jolla Laboratory

August 3 - Johan Potgieter, National Elec. Eng. Research Institute, Pretoria, South Africa.

- African Fisheries Ministers delegation (see picture).

August's distinguished visitors included fisheries ministers from five African countries. Pictured left to right are: Mr. Ron Rinaldo (SWFC), Mr. John Carr (SWFC), Dr. Jousif Ishag Medani (Sudan), Mr. Gaston Mfoutou (Congo), Mr. Akwetey Kuwadah (Togo), Mr. Kourdina Lassou (Chad), Ms. Jackie Jennings (SWFC), Mr. Adeyemi Fagbohoun (Benin), Mr. Wallace Pinfold (U.S. State Department interpreter), and Mr. Russell (traveling with the Africans).

6 - Ralph E. Hischke, The Rand Corp., Santa Monica, Ca.

8 - John Hood, Terminal Rentals, San Diego, Ca.

13 - Dr. A.R. Bayoumi, Institute of Oceanography and Fisheries, Cairo, Egypt.

- Arie Back, Israel Oceanographic and Limnological Research Haifa, Israel.

- Edwin L. Scott, NMFS/Southeast Fisheries Center, Miami, Fl.

14 - A.A. Fitzpatrick, San Diego, Ca.

- Gerald C. Saladin, Capt. NOAA Corp., Oceanographer Captain.

15 - Karen Partoyan, California Coastal Commission, San Francisco, Ca.

16 - David Deuel, NMFS, Washington, D.C.

- Newton Harrison, UC, San Diego.

- Clarence Pautzke, Pacific Marine Fisheries Commission.

21 - John W. Jolley, Jr., Florida Dept. of Natural Resources Marine Lab, WPB Florida.

22 - Stephen Goldberg, Whittier College Biology Dept., Whittier, Ca.

- Barbara Loucks, San Diego, Ca.

23 - Mike McCormick, NJMSL, New Jersey.

27-30 - Kay Paine, Northeast Fisheries Center, Woods Hole, Mass.

- John Laird, Northeast Fisheries Center, Woods Hole, Mass.

28 - Paul and Corinne Schachtes, FUHS, Fullerton, Ca.

30-31 - Richard B. Perry, National Ocean Survey, Rockville, Md

- Jim Sullivan, National Ocean Survey, Rockville, Md.

- Pat Grise, California Coastal Commission, San Francisco, Ca.

Pacific Environmental Group

August 15 - Dr. R. Michael Laurs, NMFS, La Jolla, Ca.

- Mr. Fred Jurich, California State University, Humbolt, Arcata, Ca.

24 - Mrs. Kathy Link, NMFS, Tiburon, Ca.

Tiburon Laboratory

August 1 - Dr. Joel Hedgpeth, Society for the Prevention of Progress, Santa Rosa, Ca.

- Jim Kean, Independent Journal, San Rafael, Ca.

- Dr. and Mrs. Victor Loosanoff, Greenbrae, Ca.

- Mario Pamatmat, Tiburon Center for Environmental Studies, Tiburon, Ca.

- Silsby Pelissero, Ark News, Tiburon, Ca.

10 - Dr. Frederick Weiss, Research Chemist, Shell Development, Houston, Tx.

13 - J.W. Cornacchia, University of California, Davis, Ca.

- Floyd Anders, Southwest Region, Terminal Island, Ca.

- Izadore Barrett, Southwest Fisheries Center, La Jolla, Ca.

16 - Robert Demory, Oregon Department of Fish and Wildlife, Newport, Or.

- Ted Evans, Seattle, Wa.

- Donald Gunderson, College of Fisheries, University of Washington, Seattle, Wa.

- Tom Jow, California Department of Fish and Game, Menlo Park, Ca.

- Alan Millikan, Washington Department of Fisheries, University of Washington, Seattle, Wa.

17 - Douglas Ancona, U.S. Department of Commerce, NOAA, Seattle, Wa.

21 - Allen Cattell, San Francisco, Ca.

- Dean Farrell, Sausalito, Ca.

24 - Marvin Jung, State Water Resources Control Board, Sacramento, Ca.

- Mr. & Mrs. Herman H. Quinton, Beaumont, Tx.

- Mr. & Mrs. James H. Quinton, Vallejo, Ca.

31 - Dr. Joseph J. Cech, Assistant Professor, University of California, Davis, Ca.

MEETINGS AND TRAVEL

Honolulu Laboratory

August 2 - R. Shomura met with Dr. Tim Smith, SWFC, La Jolla, and Martin Vitousek and Dr. Philip Helfrich of the University of Hawaii to discuss the University's PBY.

7 - R. Shomura attended the Townsend Cromwell post and pre-cruise meeting.

- R. Shomura called a meeting at the Laboratory to discuss ciguatera with Honolulu Laboratory staff members and representatives from the State (including University of Hawaii), the local fishing industry and SWR.

8 - R. Shomura attended a meeting at University of Hawaii Sea Grant to discuss the Northwestern Hawaiian Islands Tripartite Program with Dr. Richard Grigg, Hawaii Institute of Marine Biology and Dr. Jack Davidson, Sea Grant.

9-11 - R. Shomura traveled to SWFC, La Jolla to discuss the Honolulu Laboratory's research program with Center Director Barrett.

16 - R. Shomura called a meeting at the Laboratory attended by Frank Goto and Brooks Takenaka, United Fishing Agency, Honolulu; Dr. Robert Nakamura, University of Hawaii; Walter Ikehara, University of Hawaii graduate student; and HL staff members Dr. Andrew Dizon and Bernard ito to discuss "burnt" tuna.

17 - R. Shomura and B. Ito, together with other local fishing industry and academic interests, met with Senator Daniel K. Inouye to discuss ciguatera.

- R. Shomura, Doyle Gates, Administrator, WPPO, and Dale Coggeshall, Hawaii Administrator, U.S. Fish and Wildlife Service had a luncheon meeting to discuss matters of mutual interest.

20 - R. Shomura, John C. Marr, Executive Director, Western Pacific Regional Fishery Management Council, and Dr. Philip Helfrich, Associate Dean, Research Administration, University of Hawaii, met at the Council office to review several contract proposals to redraft the billfish and spiny lobster FMPs.

22-24 - R. Shomura attended the 19th Western Pacific Council meeting in Kailua-Kona and reported on the proceedings of the turtle workshop, the Shimizu Tuna and Billfish Stock Assessment Workshop, and the FAO Southeast Asia and Southwest Pacific Tuna Management Workshop. Shomura was also involved in the preparation of the regulatory analysis section of the Precious Coral FMP which was discussed to the meeting. George Evering, HL foreign observer on the Japanese fishing vessel Aso Maru, also reported on his observations on the vessel which recently fished at Hancock Seamount.

La Jolla Laboratory

July 29 - August 2 - D. Mackett traveled to Washington, D.C. to attend RD/CD meeting sessions for FY 82 program planning.

July 30 - August 3 - I. Barrett traveled to Washington, D.C. to attend Regional/Center Directors' meetings.

- T. Smith traveled to Honolulu to attend the Sea Turtle Workshop.

August 2-3 - G. Sakagawa and J. Squire traveled to Long Beach to attend the Billfish FMP Development Team meeting.

5-6 - D. Huppert traveled to Oak View, Ca. for a site visit of the Center for Natural Areas office, to deliver some forms, and to present a progress report.

8-9 - I. Barrett traveled to San Jose, Ca. to attend the Pacific Fishery Management Council's Scientific and Statistical meeting.

- N. Beerman traveled to Terminal Island to get tuna import data from Market News & Foreign Fishery Statistics Service.

- J. Squire traveled to San Jose, Ca. to attend the SSC discussion and PFMC discussion on the Billfish Management Plan.

9 - D. Huppert traveled to San Jose, Ca. to attend a PFMC subcommittee meeting on team responsibilities.

13-14 - I. Barrett traveled to Tiburon, Ca. to discuss administrative and scientific matters with the director and staff.

- R.M. Laurs traveled to Monterey, Ca. to attend a SEASAT orientation workshop.

13-16 - J. Hunter traveled to Fort Collins, Co. to attend a Marine Habitat Evaluation Procedure Workshop.

16-25 - R.M. Laurs traveled to Estes Park, Co. to attend the NOAA Remote Sensing workshop there, and then went to Portland, Or. to meet with PFMC personnel about a satellite study. While in Portland, Laurs also met with staff from the Oregon Department of Wildlife.

20-22 - F. Kellenberger traveled to Portland, Or. to attend a meeting of the PFMC Committee on Goals and Guidelines.

28 - R. Lasker, G. Stauffer and D. Huppert traveled to Long Beach, Ca. to attend a meeting of the Anchovy Management Team.

28 - F. Kellenberger traveled to Terminal Island to meet with SWR and CF&G personnel on PACES.

Pacific Environmental Group

August 16 - September 16 - Mr. Gunter Seckel traveled to Khabarovsk, USSR to attend the Pacific Science Congress and post Congress Scientific tour. Mr. Seckel was convenor of symposium "The role of the Pacific Ocean in climate fluctuations and presented a paper entitled "Climate impact on the fishery resources of the eastern North Pacific."

August 23 - Mrs. Margaret Lazanoff traveled to San Francisco, Ca. to purchase supplies for PEG.

24 - Mrs. Kathy Link traveled to Monterey, Ca. to deliver supplies to PEG and discuss XBT project with PEG staff.

Tiburon Laboratory

July 30 - August 7 - Dr. William H. Lenarz and Tina Echeverria traveled to the University of Maine, Orono, to attend meetings of the American Society of Ichthyologists and Herpetologists and a U.S.A./U.S.S.R. Workshop on Fish Systematics.

6 - Norman J. Abramson, Dr. Jeannette A. Whipple, and the Physiology staff of the Tiburon Laboratory attended the striped bass hearing held in San Francisco, Ca., which was conducted by the State Water Resources Control Board and the California Department of Fish and Game. Deputy Administrator James P. Walsh addressed the meeting and was followed by Dr. Whipple who discussed striped bass abnormalities and their possible connection to pollution.

8-10 - Ed Ueber attended the Groundfish Management Team and Council meeting in San Jose, California.

9 - Daniel Ralph traveled to Oroville, Ca. to adjust the chemical imprinting apparatus for Tiburon's salmon held at the Feather River Hatchery.

10 - Dr. Frederick Weiss, Research Chemist, Shell Development, Houston, Texas, met with Dr. Jeannette A. Whipple at our Laboratory, to discuss potential sources of petroleum hydrocarbons in pesticides, and and also plans for the upcoming AAAS meeting in June 1980.

15 - Norman J. Abramson chaired the 1979 Affirmative Action Plan Meeting held at the Tiburon Laboratory, to discuss results of sessions held between supervisors and employees.

16-17 - Dr. William H. Lenarz and Ed Ueber participated in the Groundfish Management Team Meeting held at the Tiburon Laboratory. The main purpose of the meeting was to finalize the Groundfish Management Plan scheduled for presentation at the Pacific Fishery Management Council's September meeting in Portland, Oregon.

22 - Michael Hertz, Oceanic Society, San Francisco Bay Chapter, met with Dr. Jeannette A. Whipple at the Tiburon Laboratory, to discuss upcoming Oceanic Society hearings and offshore drilling along the California coastline.

- Dr. Edmund S. Hobson traveled to Santa Barbara, California, to participate in the California State Sea Otter Scientific Advisory Committee meeting.

24 - Marvin Jung, State Water Resources Control Board (SWRCB), Sacramento, Ca., visited the Tiburon Laboratory. At this time he met with Dr. Jeannette A. Whipple, to discuss requirements for the upcoming SWRCB contract and the redesigning of part of the analytical laboratory which will be used to conduct contaminant-free autopsy and subsampling work.

28 - Karen Partoyan, California Coastal Commission, met with Mickey Eldridge at the Tiburon Laboratory, to discuss potential effects of oil on the fisheries.

PERSONNEL

Honolulu Laboratory

August 8 - Jeffrey J. Polovina, Statistician - Completion of temporary appointment.

13 - Brian S. Joyo, Biological Aid (Microbiology) - Conversion to new temporary appointment.

La Jolla Laboratory

August 12 - DeLoris Hobbs, Secretary - Promotion.

26 - Fred Kellenberger, Data Systems Manager - Promotion.

- Larry Hansen, Biological Technician - Promotion.

27 - Bill Brinkerhoff, Biological Technician - Promotion.

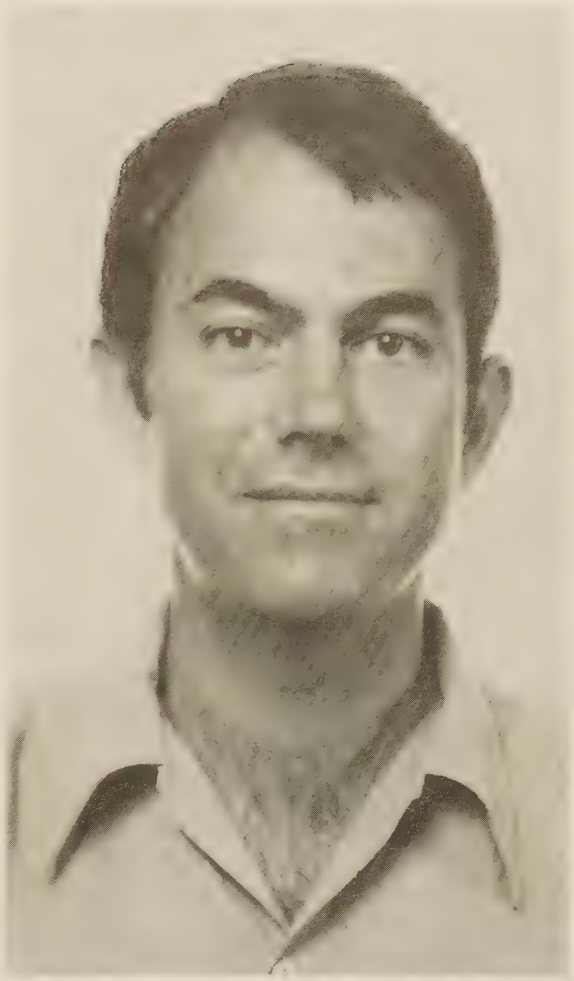
Tiburon Laboratory

August 12 - Jeannette A. Whipple, Fishery Biologist (Research) - Promotion.

31 - Candis Cooperrider, Biological Technician - Resignation.

- Daniel F. Howard, Biological Aid - Resignation.

Staff Additions



Wesley W. Parks, 36, entered-on-duty at the La Jolla Laboratory on August 27 as Leader of the Tuna Resources Program of the Oceanic Fisheries Resources Division.

Parks graduated from the University of Washington with a B.S. degree in mathematics in 1966. Following three years in the U.S. Army as an Armor Officer during the period of the Vietnamese War, he re-entered the University of Washington studying fishery population dynamics and operations research. In 1975 he was granted a Ph.D. by the University's College of Fisheries.

After graduation Parks joined the staff of the Atlantic Bluefin Tuna Program at the Miami Laboratory of the Southeast Fisheries Center where he was responsible for conducting population dynamic and management research analyses of bluefin tuna fisheries. He presented results of his analyses to the 1975 and 1976 annual meetings of the International Commission for the Conservation of Atlantic Tunas' Standing Committee on Research and Statistics, to the 1976 meeting of the International Council for the Exploration of the Seas and to fishery constituent groups.

Between February 1977 and August 1979, Parks was employed by the San Diego-based fishery research and development consulting firm, Living Marine Resources, Inc. At LMR he conducted population dynamic analyses on Atlantic and Pacific tunas and billfishes, various Atlantic and Pacific sardine-like species, and on eastern tropical Pacific porpoise. He worked on projects for a variety of commercial and government clients as well as for commercial fishery associations. He was an expert witness at the 1977 Administrative Law Judge hearings addressing United States tuna purse seine fishery porpoise kill quotas.

Parks is married to the former Ruth Ann Lewis, an elementary school teacher. They have no children.

Fishery Biologist Hillary Dyal transferred from the Woods Hole Fisheries Service Laboratory to the Southwest Center at La Jolla in August. She will be working for Dr. Wesley Parks, the newly-appointed Leader of the Tuna Resources Program.

Dyal received her Bachelor's degree at the Florida Institute of Technology. While at Woods Hole, she particpated in the Upward Mobility Program for on-the-job training, and attended Bridgewater State College in Massachusetts. Prior to her arrival at the Southwest Fisheries Center, Dyal completed some coursework in statistics at Iowa State University.

Picquelle

Susan Picquelle joined the staff of the La Jolla Laboratory in August as Statistician. She recently received a Master's degree in statistics at the University of California, Riverside, and will be working with Dr. Gary Stauffer.

Picquelle's first assignment is to analyze pilot spotter data from the aerial marine resource monitoring program.

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